

CLAIMS

1. A method of manufacturing a rack guide base body in a rack guide consisting of a rack guide base body for use in a rack-and-pinion type steering apparatus and a slider secured to said rack guide base body, comprising the steps of:

forming in a die a cavity having a pair of semicylindrical convex surfaces and a pair of planar surfaces each located between the pair of semicylindrical convex surfaces, having a recessed surface located on one axial end portion side inwardly of the pair of semicylindrical convex surfaces and the planar surfaces, and having a cylindrical surface located on another axial end portion side inwardly of the pair of semicylindrical convex surfaces and the planar surfaces;

forming runner channels for respectively allowing said cavity to communicate with a gate at one planar surface and with an overflow well at another planar surface;

die casting said rack guide base body by forcing molten metal of aluminum or zinc, or an aluminum alloy or a zinc alloy, from the gate into the cavity; and

cutting off runners formed by the respective planar surfaces and integrally joined to the planar surfaces of said rack guide base body.

2. The method of manufacturing a rack guide base body according to claim 1, wherein said cavity is formed so as to have a circular arc-shaped recessed surface.

3. The method of manufacturing a rack guide base body according to claim 1, wherein said cavity is formed so as to have a recessed surface including a pair of mutually opposing planar surfaces and a pair of inclined surfaces respectively extending integrally from the pair of planar surfaces.

4. The method of manufacturing a rack guide base body according to any one of claims 1 to 3, wherein said cavity is formed so as to be further provided with a

small-diameter cylindrical surface connected at one end to a center of a bottom of the recessed surface, located inwardly of the pair of semicylindrical convex surfaces and the planar surfaces, and having a diameter smaller than that of the cylindrical surface.

5. The method of manufacturing a rack guide base body according to claim 4, wherein said cavity is formed so as to be further provided with an annular surface connected at its inner peripheral end to another end of the small-diameter cylindrical surface and connected at its outer peripheral end to one end of the cylindrical surface.

6. The method of manufacturing a rack guide base body according to any one of claims 1 to 5, wherein said cavity is formed so as to have a pair of planar surfaces connected to respective ends of a bottom of the recessed surface and opposed to each other.

7. The method of manufacturing a rack guide base body according to any one of claims 1 to 6, wherein said cavity is formed so as to have at least one row of semi-annular recessed portions communicating with each other and provided in respective ones of the pair of semicylindrical convex surfaces and the pair of planar surfaces.

8. The method of manufacturing a rack guide base body according to any one of claims 1 to 6, wherein said cavity is formed so as to have at least two rows of semi-annular recessed portions communicating with each other and provided in respective ones of the pair of semicylindrical convex surfaces and the pair of planar surfaces.

9. The method of manufacturing a rack guide base body according to claim 7 or 8, wherein said cavity is formed so as to have semi-annular recessed portions provided in the respective ones of the pair of semicylindrical convex surfaces and the pair of planar surfaces located at positions offset in an axial direction from the recessed surface

toward a side of the cylindrical surface.

10. The method of manufacturing a rack guide base body according to any one of claims 7 to 9, wherein runner channels are formed for allowing said cavity to communicate with the gate in a plurality of portions of the one planar surface separated with respect to the axial direction by the semi-annular recessed portions and communicate in the other planar surface with the overflow well at a plurality of portions separated with respect to the axial direction by the semi-annular recessed portions.

11. The method of manufacturing a rack guide base body according to any one of claims 1 to 10, wherein said cavity is formed so as to have narrow-width protruding portions respectively extending from vicinities of the bottom of the recessed surface to apex surfaces of the recessed surface along edge portions on both sides of the recessed surface.

12. A rack guide comprising:

a rack guide base body having on its outer peripheral surface a pair of semicylindrical surfaces and a pair of planar surfaces each located between the pair of semicylindrical surfaces, having a recessed surface located on one axial end portion side inwardly of the pair of semicylindrical surfaces and the planar surfaces, and having a cylindrical surface located on another axial end portion side inwardly of the pair of semicylindrical surfaces and the planar surfaces; and

a slider secured to said rack guide base body.

13. The rack guide according to claim 12, wherein said rack guide base body has a circular-arc shaped recessed surface.

14. The rack guide according to claim 12, wherein said rack guide base body has a recessed surface including a pair of mutually opposing planar surfaces and a pair of

inclined surfaces respectively extending integrally from the pair of planar surfaces.

15. The rack guide according to any one of claims 12 to 14, wherein said rack guide base body has a hole in a center of a bottom of the recessed surface, and said slider has a projecting portion which is fitted in the hole of said rack guide base body.

16. The rack guide according to claim 15, wherein the hole is constituted by a through hole or a hole with a bottom.

17. The rack guide according to any one of claims 12 to 16, wherein the pair of planar surfaces are connected to respective ends of the bottom of the recessed surface and are located in such a manner as to oppose each other.

18. The rack guide according to any one of claims 12 to 17, wherein said rack guide base body has at least one annular groove in the outer peripheral surface consisting of the pair of semicylindrical surfaces and the pair of planar surfaces.

19. The rack guide according to any one of claims 12 to 17, wherein said rack guide base body has at least two rows of annular grooves in the outer peripheral surface consisting of the pair of semicylindrical surfaces and the pair of planar surfaces.

20. The rack guide according to claim 18 or 19, further comprising an elastic ring fitted in the annular groove in such a manner as to partially project from the outer peripheral surface to an outside.

21. The rack guide according to any one of claims 12 to 20, wherein said rack guide base body has narrow-width protruding portions respectively extending from vicinities of the bottom of the recessed surface to apex surfaces of the recessed surface along edge portions on both sides of the recessed surface.